REMARKS

Applicant takes the liberty of adding new claims 8 and 9. Basis occurs at page 5, lines 15-18 of the specification.

Step (c) Is A Softening Step

Third step (c) in claims 1 and 4 is not meant to define the conditions for completely curing the flat board-shaped laminate provided in first step (a). On the contrary, third step (c) is meant to define the conditions for softening a cut board formed during the cutting of first step (a) and cooling the softened board sufficiently to obtain the desired intermediate product as a semi-hardened product having a hardening degree of 1 to 80%, preferably 1 to 50%.

The McKague Conditions

McKague simply teaches that laminate 34 can be stored for cutting at room temperature (low humidity storage environment) due to the hygroscopic nature of the McKague composite materials. In McKague the uncured or partially cured laminate 34 (see method 24 of Fig. 2 in McKague) is heated in an oven, autoclave, etc., to a temperature greater than T_g until curing has advanced sufficiently so that the final shape of part 42 can be maintained during subsequent processing, including additional curing. During the additional curing, the temperature in McKague would be maintained in a range of from 300°F (149°C) to 350°F (177°C), whereby resin curing is completed.

McKague Does Not Teach Step (a)

McKague teaches that material 5250 is partially cured at 300°F (149°C) for 95 minutes to obtain a 43% cured material with an additional cure at 375°F (191°C) for 90 minutes to obtain a

93% cured material and that material 855-7A is partially cured at 250°F (121°C) for 30 minutes to 120 minutes to obtain a 15-41% cured material.

The McKague temperatures are seen to be very high. Thus, quite clearly, standing alone, McKague fails to teach or suggest the conditions claimed in first step (a) herein, such as heating at a recited temperature of 20-100°C under 0.1 to 10 kg/cm^2, and fails to teach cooling at 10-30°C under 0.1 to 10 kg/cm^2 so as to avoid the generation of disordered fiber orientation/formation of insufficient stacking as claimed herein.

McKague Does Not Teach Step (c)

McKague fails to teach the conditions recited in third step (c) of the present claims, namely the heating and preferred heating temperatures and the times for softening the board, and then cooling at a defined and claimed temperature/pressure to avoid the disordered fiber orientation/insufficient forming of the intermediate product problem *(the step (c) disorder problem)* solved by the present invention, which enables one of ordinary skill in the art to obtain an intermediate product (semi-hardened) with a hardening degree of 1 to 80%, preferably 1 to 50%.

Hiyamizu Does Not Remedy the Defects of McKague

Although Hiyamizu might teach a device for continuously producing fiber-reinforced composite materials of an extreme length when no cutter or the like is used, e.g., about 100 m long, by laminating and pressing a plurality of prepregs at 100-160°C using a hot roller, this is quite different from the present invention which involves heating at 20-100°C in first step (a), which avoids any excessive increase in fluidity which would be encountered when the heating

temperature is more than 100°C. There is no teaching in Hiyamizu of altering from such Hiyamizu conditions which would be adverse to the present invention. Hiyamizu also fails to teach or suggest a cooling temperature, though Hiyamizu does teach the use of cooling plate (29). The present invention involves a cooling temperature which is specifically set at 10-30°C in first step (a).

Inherency Is Not Obviousness

Claims 1 and 4 specifically recite in first step (c) the object of avoiding *the step (c) disorder problem*. Assuming *arguendo* that this would inherently occur in the prior art - and Applicant does not admit that this is the case - it is well settled that simple inherency is not equivalent to obviousness (though inherency may be sufficient for anticipation in certain cases). None of the prior art alludes to or suggest a solution to this problem.

Hiyamizu Does Not Teach Step (c) Softening

With respect to Hiyamizu, Hiyamizu is silent regarding the conditions for third step (c) which achieves softening (not complete curing) a cut board formed by cutting (step (b)) and cooling the softened board to obtain a semi-hardened intermediate product having a defined hardening degree (1-80%; preferably 1-50%).

McKague/Hiyamizu Do Not Render The Claims Obvious

Even if McKague teaches the use of an epoxy resin or an intermediate of a fiber-reinforced composite and Hiyamizu teaches a device for continuously producing such materials by laminating/pressing prepregs at 100-160°C using a hot roller, clearly from McKague and Hiyamizu one of ordinary skill in the art is not lead to the present claim limits.

Kohli Does Not Remedy The Defects of McKague/Hiyamizu

Kohli teaches epoxy resins comprising specific imidazolecarboxamide curing agents curable above 71°C (160°F) and below 121°C (250°F) useful as adhesives and as matrix resins in reinforced composites. Kohli, Abstract.

In Kohli, a Kohli epoxy resin and a reinforcing fiber, e.g., 20-60 parts by weight of curable epoxy resin composition of the reinforcing fiber per 100 parts by weight of both components where the reinforcing fiber can include glass fibers, etc.

Kohli fails to teach, and thus cannot suggest modifying McKague or Hiyamizu, a method using a step which would correspond to third step (c) where a cut board is softened by heating at the claimed temperature time on a forming tool and cooled at a specified temperature/ pressure to achieve the object of the present invention of avoiding the *step (c) disorder problem* to obtain a semi-hardened product having hardening degrees as claimed herein.

The Combination of Claimed Steps (a) and (e) Is Not Taught

Thus, even if McKague suggests epoxy, Hiyamizu teaches a device for continuously producing a composite by laminating/pressing prepregs using a hot roller and Kohli describes epoxy curing temperatures, these three references, simply do not lead one of ordinary skill in the art to first step (a) in combination with third step (c) of the present claims.

DellaVecchia Does Not Teach Step (a)

DellaVecchia discloses producing a composite using rolls at 10-70°C below the polymer melting point and at 100-1500 lb/linear inch to form laminated sheet 25. The laminate is then cooled using rolls to quickly lower the temperature of laminate 25 to permit easy cutting. There

is little similarity between the DellaVecchia conditions for laminating and cooling and those called for in the present claims during first step (a). Thus, DellaVecchia cannot remedy the defects of the other references.

DellaVecchia Does Not Teach Step (c) Softening

DellaVecchia does not suggest the conditions for softening (not completely curing) of step (c), particularly for a cut board which could be formed by cutting composite sheet 25 in DellaVecchia. DellaVecchia does not teach the temperature/time conditions for the cut board on a forming tool nor cooling at a defined temperature/pressure to avoid the *step (c) disorder problem,* all of which in combination permit obtaining an intermediate product having a defined hardening degree as claimed.

Conclusion

Though McKague discloses the use of an epoxy resin, Hiyamizu teaches a device for laminating and pressing a plurality of prepregs at a temperature of 100-160°C using a hot roller, Kohli discloses the temperature conditions for curing a Kohli system and DellaVecchia discloses a process as discussed immediately herebefore, McKague/Hiyamizu/Kohli and DellaVecchia contain insufficient teaching or motivation for one of ordinary skill in the art to be led to the subject matter claimed herein.

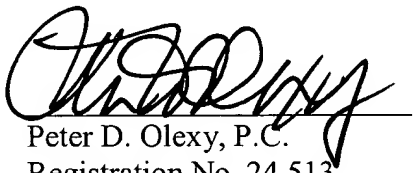
The Examiner is requested to reconsider his position and allow the claims herein.

Interview Summary

With respect to Interview Summary of the interview of August 11, 2004, the Examiner focused on the temperature ranges and suggested arguments be advanced regarding some

unexpected benefit to the temperature/pressure ranges of the claims. The Examiner suggested focusing on why the prior art would require temperatures above 100°C. With respect to the generation of disorder fiber orientation/formation of insufficient stacking or insufficient forming, etc., the Examiner questioned as to whether the same would be just a result of the resin not excessively flowing at the conditions of the present claims. Finally, the Examiner suggested that there was some strength to the argument regarding the degree of curing at 5-20% in the claims herein, but 1-80% was extremely broad and should include the prior art.

Respectfully submitted,



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